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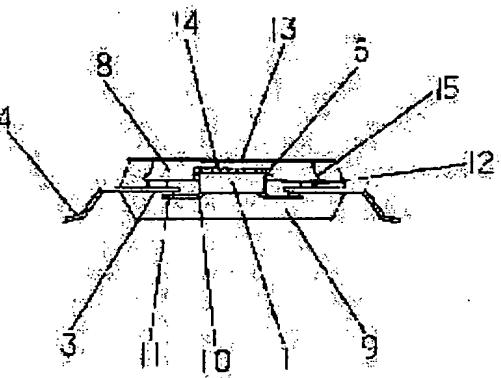
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## (54) SEMICONDUCTOR DEVICE AND ITS MANUFACTURE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a thin, compact, light and inexpensive semiconductor device which is excellent in heat dissipation function.

**SOLUTION:** A TAB tape is built in a package of this semiconductor device. An electrode of a semiconductor element 1 and a TAB tape inner lead 10, and a TAB tape outer lead 11 and a lead frame inner lead 3 are connected with each other. The surface with an electrode of the semiconductor element 1 and its opposite surface are fixed to a heat sink 8. A part wherein a semiconductor element of a heat sink is fixed is provided with a recess 14 which constitutes a plane which is larger than a plane area of a semiconductor element. According to this constitution, it is possible to further thin a semiconductor device.



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CLAIMS

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[Claim(s)]

[Claim 1] The TAB tape to which it has the semiconductor device which has an electrode, and a TAB tape outer lead and a TAB tape inner-lead, and this TAB tape inner-lead and said electrode were connected, The leadframe to which it has a leadframe outer lead and a leadframe inner lead, and this leadframe inner lead and said TAB tape outer lead were connected, The semiconductor device characterized by the field which has said electrode of said semiconductor device, and an opposite side consisting of mold resin which closed the heat sink fixed directly, and the leadframe and heat sink except said semiconductor device, said TAB tape, and said leadframe outer lead.

[Claim 2] The semiconductor device according to claim 1 characterized by coming to use the adhesive tape which is installed to the location where said leadframe inner lead sees superficially, and laps with said heat sink, and fixes both sides between said leadframe inner leads and said heat sinks.

[Claim 3] The part to which said semiconductor device of said heat sink is fixed is a semiconductor device according to claim 1 or 2 characterized by giving the hollow which constitutes a larger flat surface than the plane area of said semiconductor device.

[Claim 4] The depth of said hollow is a semiconductor device according to claim 1 to 3 characterized by supposing that it is equivalent to the thickness of said semiconductor device.

[Claim 5] Said heat sink is a semiconductor device according to claim 1 to 4 characterized by making an appearance into the shape of a wedge.

[Claim 6] The manufacture approach of the semiconductor device characterized by coming to contain the process which connects with adhesives the opposite side and the heat sink of the process which connects the process which connects the electrode and the TAB tape inner lead of a semiconductor device, and a TAB tape outer lead and a leadframe inner lead, and the field which has said electrode of said semiconductor device, and the process which closes said semiconductor device, said TAB tape inner-lead, said TAB tape outer lead, said leadframe inner lead, and a heat sink by mold resin.

[Claim 7] The manufacture approach of the semiconductor device according to claim 6 characterized by coming to contain the process which carries out adhesion immobilization of said leadframe inner lead and said heat sink with insulating heat adhesive tape in addition to said each process.

[Claim 8] The manufacture approach of the semiconductor device according to claim 7 further characterized [ including the process which makes the process which connects said semiconductor device and heat sink with adhesives dry said adhesives ] by to perform to coincidence the process which dries said adhesives, and the process which dry said insulating heat adhesive tape including the process which makes the process which carries out adhesion immobilization of said leadframe inner lead and said heat sink with insulating heat adhesive tape dry insulating heat adhesive tape.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

#### [0001]

[Industrial Application] Especially this invention relates to the semiconductor device which excelled [thin shape] in the heat dissipation effectiveness, and its manufacture approach about a semiconductor device and its manufacture approach.

#### [0002]

[Description of the Prior Art] Drawing 5 is the sectional view of a semiconductor device with the function to make generation of heat from the semiconductor device of a Prior art emit through a heat sink.

[0003] The conventional leadframe contains the leadframe die putt (a die pad is called hereafter) 5, the leadframe inner lead 3, and the leadframe outer lead 4 as the configuration, the adhesives 6, such as a silver paste, are used for a die pad 5, and installation immobilization of the semiconductor device 1 is carried out. And in the opposite side of the field where installation immobilization of the semiconductor device 1 of a die pad 5 is carried out, the heat sink 8 aiming at heat dissipation of the heat emitted at the time of operation of a semiconductor device 1 has fixed using the adhesives 7, such as a silver paste. The electrode of a semiconductor device 1 and the leadframe inner lead 3 are connected by the gold streak 2. 9 is mold resin and is closing a semiconductor device 1, a gold streak 2, the leadframe inner lead 3, the die putt 5, adhesives 6 and 7, and a heat sink 8. In addition, the closure of a part of heat sink is carried out so that it may expose. And it bent and the leadframe outer lead 4 was processed so that it might be easy to mount.

[0004] The semiconductor device of drawing 5 is manufactured as follows. The heat sink 8 aiming at heat dissipation of the heat emitted by the background of the leadframe die putt 5 at the time of operation of a semiconductor device 1 is fixed using the adhesives 7, such as a silver paste. Next, a semiconductor device 1 is fixed using the adhesives 6, such as a silver paste, to the side front of the leadframe die putt 5. Next, the electrode of a semiconductor device 1 and the leadframe inner lead 3 are connected by the gold streak 2 by the wire-bonder-machine. Next, the resin seal of a semiconductor device 1, a gold streak 2, the leadframe inner lead 3, the leadframe die putt 5, adhesives 6, adhesives 7, and the heat sink 8 is carried out to the appearance around which resin does not turn to the heat sink exposure 13 at a mold process. Finally the leadframe outer lead 4 is bent at a press process, and it is made to process and complete.

[0005] On the other hand, in the semiconductor device process process of these days, a semiconductor device is made as small as possible and there is a motion of wanting to increase the picking number from the wafer of one sheet, and to rationalize. This wants to integrate the semiconductor device itself highly more, to miniaturize and to use it by high power further.

#### [0006]

[Problem(s) to be Solved by the Invention] Although narrow-ization between the pitches of an electrode was attained as a result with high integration and a miniaturization of the above-mentioned semiconductor device, narrow-izing which set like the semiconductor device erector using a gold streak, and exceeded the fixed limit from the relation of use BONDINGUTSU-RU was impossible.

[0007] Moreover, when the electrode of a semiconductor device 1 and the leadframe inner lead 3 are connected using a gold streak 2, it is necessary to make a gold streak 2 higher than the top face of a semiconductor device 1. It is for calling this loop-formation height and preventing short-circuit with the edge of a semiconductor device 1, and a gold streak 2. Furthermore, since it was necessary to carry out the resin seal of the gold streak 2, and to protect it at a mold process, it had become a failure when making thickness of the whole semiconductor device thin.

[0008] moreover, a gold streak is also passed at the time of a resin flow at the time of carrying out the resin seal of the electrode of a semiconductor device 1, and the leadframe inner lead 3 in a mold process, when it connects using a gold streak 2 -- having -- a gold streak -- the technical problem that a comrade will short-circuit occurred.

[0009] furthermore -- criteria [ putt / 5 / die ] -- carrying out -- a semiconductor device 1 and a heat sink 8 -- the insulating adhesives 6 and 7, such as a silver paste, -- using -- fixing -- further -- a gold streak -- since loop-formation height is added, in the thickness direction of a semiconductor device, the numerosness of components mark to the whole semiconductor device thickness will become thick.

[0010] The technical problem described above is solved, and while it is cheap and being able to attain miniaturization, thin-shape-izing, and lightweight-ization, it aims at acquiring the semiconductor device with which the heat dissipation effectiveness is acquired, and its manufacture approach.

[0011]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem the semiconductor device of the invention in this application The TAB tape to which it has the semiconductor device which has an electrode, and a TAB tape outer lead and a TAB tape inner-lead, and this TAB tape inner-lead and said electrode were connected, (Means 1) The leadframe to which it has a leadframe outer lead and a leadframe inner lead, and this leadframe inner lead and said TAB tape outer lead were connected, It is characterized by the field which has said electrode of said semiconductor device, and an opposite side consisting of mold resin which closed the heat sink fixed directly, and the leadframe and heat sink except said semiconductor device, said TAB tape, and said leadframe outer lead.

[0012] (Means 2) And in the above-mentioned semiconductor device, it is installed to the location where said leadframe inner lead sees superficially, and laps with said heat sink, and is characterized by coming to use the adhesive tape which fixes both sides between said leadframe inner leads and said heat sinks.

[0013] (Means 3) And in one of the above-mentioned semiconductor devices, the part to which said semiconductor device of said heat sink is fixed is characterized by giving the hollow which constitutes a larger flat surface than the plane area of said semiconductor device.

[0014] (Means 4) In one of the further above-mentioned semiconductor devices, it is characterized by the depth of said hollow presupposing that it is equivalent to the thickness of said semiconductor device.

[0015] (Means 5) In one of the further above-mentioned semiconductor devices, said heat sink is characterized by making an appearance into the shape of a wedge.

[0016] The process which connects the electrode and TAB tape inner lead of a semiconductor device in the manufacture approach of a semiconductor device again, (Means 6) The process which connects a TAB tape outer lead and a leadframe inner lead, The process which fixes with adhesives the opposite side and heat sink of the field which has said electrode of said semiconductor device, It is characterized by coming to contain the process which closes said semiconductor device, said TAB tape inner-lead, said TAB tape outer lead, said leadframe inner lead, and a heat sink by mold resin.

[0017] (Means 7) It is characterized by coming to contain the process which carries out adhesion immobilization of said leadframe inner lead and said heat sink with insulating heat adhesive tape in addition to said each process in the manufacture approach of the above-mentioned semiconductor device again.

[0018] (A means 8) It is further characterized by to perform to coincidence the process which makes the process which carries out the adhesion immobilization of said leadframe inner lead and said heat

sink with insulating heat adhesive tape dry said adhesives including the process which dries insulating heat adhesive tape, and the process which dry said insulating heat adhesive tape including the process which makes the process which connects said semiconductor device and heat sink with adhesives in the manufacture approach of the above-mentioned semiconductor device dry said adhesives.

[0019]

[Function] By taking a configuration like a means 1, since connection of the electrode of said semiconductor device and said leadframe inner lead is made through a TAB tape, the rationalization which makes the above-mentioned semiconductor device as small as possible is attained, and the miniaturization of the semiconductor device after a mold resin seal, thin-shape-izing, and lightweight-ized \*\* can be planned.

[0020] Moreover, it is hard coming to generate gap with said leadframe inner lead and said heat sink, in case it becomes possible to certainly fix said leadframe inner lead and said heat sink and a resin seal is carried out at a mold process by taking a configuration like a means 2.

[0021] moreover, the condition that said semiconductor device was dropped into the hollow of said heat dissipation version by taking a configuration like a means 3 -- becoming -- this -- it drops and thin shape-ization of the semiconductor device after a part mold resin seal is attained.

[0022] Moreover, by taking a configuration like a means 4, since said semiconductor device is dropped into the hollow of said heat dissipation version, short-circuit with said TAB tape inner lead and dirty section of said semiconductor device is suppressed.

[0023] Moreover, by taking a configuration like a means 5, improvement in adhesion with said heat dissipation version and mold resin is achieved at the time of a mold resin seal, and omission prevention of said heat sink can be performed after a mold resin seal.

[0024] By taking the manufacture approach still like a means 6, immobilization with adhesives can carry out certainly the opposite side and heat sink of a field which have the connection with said TAB tape outer lead aforementioned leadframe inner lead, and said electrode of said semiconductor device, the in-process inspection in each process is easy, and improvement in the working efficiency in each process can be aimed at.

[0025] Moreover, by taking the manufacture approach like a means 7, immobilization with insulating adhesive tape can ensure said leadframe inner lead and said heat sink.

[0026] Moreover, by taking the manufacture approach like a means 8, a reduction by half of the process which dries said adhesives, and the desiccation process of said insulating adhesive tape can be aimed at.

[0027]

[Example] Drawing 1 shows the 1st example of this invention. It is the sectional view of a semiconductor device and connection between the electrode of a semiconductor device and a TAB tape inner lead, connection between a TAB tape outer lead and a leadframe inner lead, and the relation between a semiconductor device and a heat sink are shown especially using a TAB tape. A TAB tape here uses adhesives for insulating tapes, such as polyimide, pastes up copper foil on them, masks and leaves a required pattern by the resist, and says that others are removed by etching. It is as thin as about 100 micrometers - 110 micrometers at the total thickness of insulating tapes, such as copper foil + adhesives + polyimide, and narrow-izing is possible for the pitch of a pattern to about 70 micrometers.

[0028] In drawing 1 , the electrode and the TAB tape inner lead 10 of a semiconductor device 1 are connected. Generally this connection is alloy junction, such as gold, aluminum, gold and gold or gold, and tin. On the other hand, it connects also with the TAB tape outer lead 11 and the leadframe inner lead 3. Gang bonding connection is really made, using a tool as this connection method. Generally this connection is alloy junction, such as gold, silver, gold and tin, or silver and tin. The field and opposite side (a rear face is called hereafter) which have the electrode of a semiconductor device 1 have fixed to the heat sink 8. It is good to use adhesives 6 as a member for carrying out the immobilization, and it is desirable from the point of heat dissipation effectiveness to use especially the adhesives of a silver paste. The closure of the leadframe except the TAB tape and leadframe outer lead containing a

semiconductor device 1, the TAB tape inner lead 10, and the TAB tape outer lead 11, and the adhesives 6, such as the leadframe inner lead 3 and a silver paste, and the heat sink 8 except an exposure is carried out by mold resin at least. The leadframe outer lead 4 bends and processing is carried out. since connection between the electrode of a semiconductor device 1 and the leadframe inner lead 3 is made through the TAB tape inner lead 10 and the TAB tape outer lead 11 and a gold streak is not used -- a gold streak -- it becomes unnecessary to take loop-formation height into consideration, and, as a result, thin shape-ization of the semiconductor device itself can be attained. Moreover, in order to connect the electrode of a semiconductor device, and a leadframe inner lead using a TAB tape, the electrode pitch of a semiconductor device can be made narrow to 70 micrometers, the miniaturization of the semiconductor device itself can be attained, and low cost-ization which, as a result, increases the picking number from the wafer of one sheet in a process process can be promoted. in order that [ furthermore, ] TAB tape total thickness may connect the electrode of a semiconductor device, and a leadframe inner lead with 100 micrometers - 110 micrometers thinly using the pattern on a tape -- a gold streak -- since it is not necessary to take loop-formation height into consideration, it becomes possible to be able to make thin the resin seal part in a mold process, and to make thickness of the semiconductor device itself thin.

[0029] The manufacture approach of the semiconductor device of this example is explained. The electrode and the TAB tape inner lead 10 of a semiconductor device 1 are connected. It really which is the general method of TAB mounting as this connection method connects by gang bonding using a tool. And the TAB tape outer lead 11 and the leadframe inner lead 3 are connected. Gang bonding connection is really made, using a tool as this connection method. The adhesives 6, such as a silver paste, are used for the background of a semiconductor device 1, and it fixes with a heat sink 8. Next, as mold resin 9 does not turn to the exposure 13 of a heat sink 8 at a mold process, the resin seal of the adhesives 6, such as a semiconductor device 1, the TAB tape inner lead 10, the TAB tape outer lead 11, the leadframe inner lead 3, and a silver paste, is carried out by mold resin 9. In addition, although the heat dissipation effectiveness is inferior a little rather than a heat sink 8 is equipped with the exposure 13 by which a resin seal is not carried out like this example, the resin seal of the heat sink 8 may be carried out completely. The leadframe outer lead 4 is bent and it is made to process and complete at a press process finally. since a gold streak is not used, without a gold streak is passed by resin in this example at the time of a resin flow at the time of carrying out a resin seal of a mold process -- a gold streak -- it is not necessary to also take a comrade's short-circuit into consideration

[0030] Said TAB tape is used. Connection between the electrode of a semiconductor device, and a TAB tape inner lead, The connection between a TAB tape outer lead and a leadframe inner lead really uses a tool, respectively. Inner-lead gang bonding, Outer lead gang bonding, A heat sink is minded for the heat which will moreover be generated in a thin shape at the time of the operation from a semiconductor device if things are made, adhesives, such as a silver paste, are used for the background of a semiconductor device, a heat sink is attached after said outer lead gang bonding and a resin seal is carried out at a mold process. \*\*\*\*\* -- A semiconductor device with the function made to emit is obtained cheaply.

[0031] Drawing 2 shows the 2nd example of this invention. Drawing 2 is the sectional view of other semiconductor devices, and shows connection between the electrode of a semiconductor device, and a TAB tape inner lead, connection between a TAB tape outer lead and a leadframe inner lead, and the relation between a semiconductor device and a heat sink especially using a TAB tape.

[0032] In drawing 2 , the electrode and the TAB tape inner lead 10 of a semiconductor device 1 are connected. Generally this connection is alloy junction, such as gold, aluminum, gold and gold or gold, and tin. On the other hand, it connects also with the TAB tape outer lead 11 and the leadframe inner lead 3. Gang bonding connection is really made, using a tool as this connection method. Generally this connection is alloy junction, such as gold, silver, gold and tin, or silver and tin. The field and opposite side (a rear face is called hereafter) which have the electrode of a semiconductor device 1 have fixed to

the heat sink 8. It is good to use adhesives 6 as a member for carrying out the immobilization, and it is desirable from the point of heat dissipation effectiveness to use especially the adhesives of a silver paste. Moreover, between the leadframe inner lead 3 and the heat sink 8, both sides have fixed using the insulating heat adhesive tape 12, such as poly IMIDOTE-PU. The closure of the leadframe except the TAB tape and leadframe outer lead containing a semiconductor device 1, the TAB tape inner lead 10, and the TAB tape outer lead 11, and the adhesives 6, such as the leadframe inner lead 3 and a silver paste, and the heat sink 8 except an exposure is carried out by mold resin at least. The leadframe outer lead 4 bends and processing is carried out. since connection between the electrode of a semiconductor device 1 and the leadframe inner lead 3 is made through the TAB tape inner lead 10 and the TAB tape outer lead 11 and a gold streak is not used — a gold streak — it becomes unnecessary to take loop-formation height into consideration, and, as a result, thin shape-ization of the semiconductor device itself can be attained.

[0033] The manufacture approach of the semiconductor device of this example is explained. Gang bonding connection of the electrode and the TAB tape inner lead 10 of a semiconductor device 1 is really made using a tool. Generally this connection is alloy junction, such as gold and aluminum. Gang bonding connection of the TAB tape outer lead 11 and the leadframe inner lead 3 is really made using a tool. Generally this connection is the alloy junction of gold, silver, etc. In one field of the leadframe inner lead 3, with the adhesives 6, such as a silver paste, the rear-face side of a semiconductor device 1 fixes both sides with a heat sink 8 using the insulating heat adhesive tape 12, such as poly IMIDOTE-PU. In case desiccation of the insulating heat adhesive tape 12, such as poly IMIDOTE-PU used for the background of a semiconductor device 1, desiccation of the adhesives 6, such as a silver paste used for fixing of a heat sink 8, one field of the leadframe inner lead 3, and fixing of a heat sink 8, really makes gang bonding connection of the TAB tape outer lead 11 and the leadframe inner lead 3 using a tool, it is performed to coincidence.

[0034] without a gold streak is passed by resin at the time of a resin flow at the time of carrying out a resin seal at a mold process since a gold streak is not used for connection between a semiconductor device and a leadframe — a gold streak — it is not necessary to also take a comrade's short-circuit into consideration The leadframe outer lead 4 is bent and it is made to process and complete at a press process finally.

[0035] Drawing 3 shows the 3rd example of this invention. Drawing 3 is the sectional view of the semiconductor device of further others, and shows connection between the electrode of a semiconductor device, and a TAB tape inner lead, connection between a TAB tape outer lead and a leadframe inner lead, and the relation between a semiconductor device and a heat sink especially using a TAB tape.

[0036] In drawing 3 , the electrode and the TAB tape inner lead 10 of a semiconductor device 1 are connected. Generally this connection is alloy junction, such as gold, aluminum, gold and gold or gold, and tin. On the other hand, it connects also with the TAB tape outer lead 11 and the leadframe inner lead 3. Gang bonding connection is really made, using a tool as this connection method. Generally this connection is alloy junction, such as gold, silver, gold and tin, or silver and tin. The field and opposite side (a rear face is called hereafter) which have the electrode of a semiconductor device 1 have fixed to the heat sink 8. The hollow 14 which constitutes a larger flat surface than the plane area of a semiconductor device is formed so that the part which the semiconductor device of a heat sink fixes may miss a semiconductor device. And it is good to use adhesives 6 as a member for fixing a semiconductor device 1 into the hollow 14, and it is desirable from the point of heat dissipation effectiveness to use especially the adhesives of a silver paste. Moreover, between the leadframe inner lead 3 and the heat sink 8, both sides have fixed using the insulating heat adhesive tape 12, such as poly IMIDOTE-PU. The closure of the leadframe except the TAB tape and leadframe outer lead containing a semiconductor device 1, the TAB tape inner lead 10, and the TAB tape outer lead 11, and the adhesives 6, such as the leadframe inner lead 3 and a silver paste, and the heat sink 8 except an exposure is

carried out by mold resin at least. The leadframe outer lead 4 bends and processing is carried out, since connection between the electrode of a semiconductor device 1 and the leadframe inner lead 3 is made through the TAB tape inner lead 10 and the TAB tape outer lead 11 and a gold streak is not used -- a gold streak -- it becomes unnecessary to take loop-formation height into consideration, and, as a result, thin shape-ization of the semiconductor device itself can be attained.

[0037] The manufacture approach of the semiconductor device of this example is explained. Gang bonding connection of the electrode and the TAB tape inner lead 10 of a semiconductor device 1 is really made using a tool. Generally this connection is alloy junction, such as gold and aluminum. Gang bonding connection of the TAB tape outer lead 11 and the leadframe inner lead 3 is really made using a tool. Generally this connection is the alloy junction of gold, silver, etc. The adhesives 6, such as a silver paste, are used for the background of a semiconductor device 1, and temporary immobilization is carried out. Furthermore, the insulating heat adhesive tape 12, such as poly IMIDOTE-PU, is used for one field of the leadframe inner lead 3, and temporary immobilization of the leadframe inner lead 3 and the heat sink 8 is carried out. Temporary immobilization of the semiconductor device 1 is carried out in the hollow 14 which misses the semiconductor device of a heat sink 8. The background of a semiconductor device 1, and the semiconductor device 1 of a heat sink 8 \*\* To temporary immobilization of \*\*\*\*\* 14 Desiccation of the insulating heat adhesive tape 12, such as poly IMIDOTE-PU used for desiccation of the adhesives 6, such as a used silver paste, one field of the leadframe inner lead 3, and temporary immobilization of a heat sink 8, the TAB tape outer lead 11 and the leadframe inner lead 3 In case gang bonding connection is really made using a tool, the heating heater currently used is utilized, it carries out to coincidence, and actual immobilization of the semiconductor device 1 is carried out at the position of a heat sink 8.

[0038] since a gold streak is not used, without a gold streak is passed by resin at the time of a resin flow at the time of carrying out a resin seal of a mold process -- a gold streak -- it is not necessary to also take short-circuit of comrades into consideration The leadframe outer lead 4 is bent and it is made to process and complete at a press process finally.

[0039] Drawing 4 is other examples of the heat sink used for the 3rd example of this invention, and is the top view and a sectional view.

[0040] The hollow 14 which misses a semiconductor device is established in the abbreviation center section which carries out loading fixing of the semiconductor device of a heat sink 8 in drawing 4 . To this hollow, adhesives, such as a silver paste, are used and a semiconductor device is fixed. Although the depth of a hollow has desirable component thickness and EQC of a semi-conductor, it becomes possible [ making thin not this limitation but the depth part semiconductor device of a hollow itself ]. Moreover, in order to prevent that a heat sink drops out after the resin seal in a mold process, the heat sink omission prevention appearance 15 is made into the shape of a wedge. Of course, it can utilize also for the semiconductor device equipped with heat dissipation functions other than an example, and the configuration of said heat sink has the cutting method, the pressing method, the etching method, the approach of mixing these, etc. as a manufacturing method of a heat sink 8, and can be manufactured cheaply.

[0041] It is cheap and manufacture of the semiconductor device of small, thin, and light \*\* is possible as stated above.

[0042]

[Effect of the Invention] It carries out to connection between the electrode of a semiconductor device, and a leadframe inner lead through a TAB tape inner lead and a TAB tape outer lead using a TAB tape. in order to use a TAB tape -- old -- like -- a gold streak -- the loop-formation height at the time of wiring becomes unnecessary, and it becomes possible to make the semiconductor device itself thin for a part in this loop-formation height. Moreover, since-izing of the circuit pattern pitch on a TAB tape can be carried out [ narrow ] to about 70 micrometers, the electrode pitch of a semiconductor device can also be doubled with 70 micrometers, the semiconductor device itself can be miniaturized, the picking

number from the wafer of one sheet in the process process which is a semiconductor device production process increases, and big effectiveness can be expected.

[0043] Moreover, by carrying out to connection between the electrode of a semiconductor device, and a leadframe inner lead through a TAB tape inner lead and a TAB tape outer lead using a TAB tape, and attaching a heat sink in the background of a semiconductor device It can do-izing. furthermore, the semiconductor device which has the function to emit the heat generated at the time of operation of a semiconductor device by preparing the hollow of the recess of the abbreviation center-section semiconductor device of the semiconductor device loading part of a heat sink, and dropping and carrying a semiconductor device in this hollow through a heat sink -- more -- a miniaturization and thin-shape-izing -- lightweight -- And it becomes possible to get cheaply.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The sectional view showing the 1st example of this invention.

[Drawing 2] The sectional view showing the 2nd example of this invention.

[Drawing 3] The sectional view showing the 3rd example of this invention.

[Drawing 4] The heat sink top view of the 3rd example of this invention, a sectional view.

[Drawing 5] The sectional view of a Prior art.

[Description of Notations]

- 1 -- Semiconductor device
- 2 -- Gold streak
- 3 -- Leadframe inner lead
- 4 -- Leadframe outer lead
- 5 -- Leadframe die putt
- 6 -- Adhesives
- 7 -- Adhesives
- 8 -- Heat sink
- 9 -- Mold resin
- 10 -- TAB tape inner lead
- 11 -- TAB tape outer lead
- 12 -- Insulating heat adhesive tape
- 13 -- Heat sink exposure
- 14 -- Hollow which misses a semiconductor device
- 15 -- Heat sink omission prevention appearance

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[Translation done.]